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EXAMINER

SINGH, DALZID E

ART UNIT PAPER NUMBER

2633

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/696,030

Applicant(s)

OKUNO, TOSHIAKI

Examiner

Dalzid Singh

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-5, 7-10, 12-14 and 16-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-5, 7-10, 12-14 and 16-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 2-5, 7-10, 12-14 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwano (US Patent No. 6,078,414) in view of Takeyari et al (US Patent No. 5,576,876).

Regarding claims 2 and 7, Iwano discloses optical transmission system, as shown in Fig. 1, comprising:

a modulation signal source (204) for outputting modulation signals of a predetermined frequency;

a semiconductor laser source (201) driven by said modulation signals outputted from said modulation signal source to output laser light (S_1 - S_N) modulated according to said modulation signals;

an optical amplifier (102) for amplifying the laser light from said semiconductor laser source;

a signal source for outputting signals to be transmitted, in the form of an electric signal (DATA) (it would have been obvious that there exist signal source for producing the DATA signal); and

an external modulator (202) which is provided on a transmission line between said semiconductor laser source and said optical amplifier, which modulates the laser light outputted from the semiconductor laser source, based on the electric signals outputted from said signal source, and which outputs the modulated laser light as light including signals to said optical amplifier.

Iwano discloses optical amplifier for amplifying the laser light from the semiconductor laser source and further shown in Fig. 1 and cited in col. 3, lines 56-67 to col. 4, lines 1-4, Iwano shows control of the semiconductor laser (201) by controlling the bias current (driving system), which is similar to applicant's system of modulation depth control (see specification on page 17, lines 6-14, applicant indicates that modulation depth is control by controlling the driving system of the semiconductor laser source). Iwano differs from the claimed invention in that Iwano does not disclose a ratio of amplitude modulation depth of amplified laser light outputted from the optical amplifier, to an amplitude modulation depth of the laser light inputted into the amplifier, is set in the range of 60% or less. However, Iwano teaches control of the modulation depth by controlling the bias current of the laser. Based on this teaching, it would have been obvious to an artisan of ordinary skill in the art at the time of the invention was made to adjust the modulation depth in the range of 60% or less. Furthermore, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Swain et al.*, 33 CCPA (Patents) 1250, 156 F.2d 239, 70 USPQ 412; *Minnesota Mining and Mfg. Co. v. Coe*, 69 App D.C. 217, 99 F.2d 986, 38 USPQ 213; *Allen et al. v. Coe*, 77 App D.C.

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324, 135 F.2d 11, 57 USPQ 136. In addition, discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Antonie*, 559 F.2d 239, 618, 195 USPQ 6 (CCPA 1977); *In re Aller*, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955). See also *In re Aller*, 105 USPQ 233 (CCPA 1955) and *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Therefore, it would have been obvious to set the modulation depth to an optimum or workable value or range by routine experimentation.

Furthermore, Iwano differs from the claimed invention in that Iwano does not disclose that the external modulation amplitude modulates the laser light. However, providing external modulation which amplitude modulates the laser light is well known. Takeyari et al is cited to show such well known concept. In col. 1, lines 42-59, Takeyari et al teach the use of amplitude modulator to modulated laser light. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to replace the external modulator of Iwano with that of amplitude modulator as taught by Takeyari et al. One of ordinary skill in the art would have been motivated to do such in order to provide simple and cost effective way of transmitting data.

Regarding claims 3 and 8, in col. 3, lines 59-61, Iwano discloses that the predetermined frequency is in the order to several kHz (such as 20kHz or less) to several MHz.

Regarding claims 4, 9, 13 and 17, in col. 3, lines 4-7, Iwano discloses that the optical amplifier comprises an erbium-doped optical fiber.

Regarding claims 5, 10, 14 and 18, as shown in Fig. 1, Iwano shows optical communication system comprising the optical transmitter (TX₁-TX_N) further comprising:

an optical transmission line (104) through which light signals outputted from said optical transmitter propagates; and

an optical receiver (106) for receiving said light signals having propagated through said optical transmission line.

Regarding claims 12 and 16, Iwano discloses optical transmission system, as shown in Fig. 1, comprising:

a modulation signal source (204) for outputting modulation signals of a frequency not more than 20 kHz (in col. 3, lines 59-61, Iwano discloses range of frequency in the order of several kHz to several MHz, therefore it would have been obvious to an artisan of ordinary skill in the art to select frequency not more than 20 kHz);

a semiconductor laser source (201) driven by said modulation signals outputted from said modulation signal source to output laser light (S₁-S_N) modulated according to said modulation signals;

an optical amplifier (102) for amplifying the laser light from said semiconductor laser source;

a signal source for outputting signals to be transmitted, in the form of an electric signal (DATA) (it would have been obvious that there exist signal source for producing the DATA signal); and

an external modulator (202) which is provided on a transmission line between said semiconductor laser source and said optical amplifier, which modulates the laser

light outputted from the semiconductor laser source, based on the electric signals outputted from said signal source, and which outputs the modulated laser light as light including signals to said optical amplifier.

Iwano discloses optical amplifier for amplifying the laser light from the semiconductor laser source and further shown in Fig. 1 and cited in col. 3, lines 56-67 to col. 4, lines 1-4, Iwano shows control of the semiconductor laser (201) by controlling the bias current (driving system), which is similar to applicant's system of modulation depth control (see specification on page 17, lines 6-14, applicant indicates that modulation depth is control by controlling the driving system of the semiconductor laser source). Iwano differs from the claimed invention in that Iwano does not disclose a ratio of amplitude modulation depth of amplified laser light outputted from the optical amplifier, to an amplitude modulation depth of the laser light inputted into the amplifier, is set in the range of 10% or less. However, Iwano teaches control of the modulation depth by controlling the bias current of the laser. Based on this teaching, it would have been obvious to an artisan of ordinary skill in the art at the time of the invention was made to adjust the modulation depth in the range of 10% or less. Furthermore, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Swain et al.*, 33 CCPA (Patents) 1250, 156 F.2d 239, 70 USPQ 412; *Minnesota Mining and Mfg. Co. v. Coe*, 69 App D.C. 217, 99 F.2d 986, 38 USPQ 213; *Allen et al. v. Coe*, 77 App D.C. 324, 135 F.2d 11, 57 USPQ 136. In addition, discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re*

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Antonie, 559 F.2d 239, 618, 195 USPQ 6 (CCPA 1977); *In re Aller*, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955). See also *In re Aller*, 105 USPQ 233 (CCPA 1955) and *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Therefore, it would have been obvious to set the modulation depth to an optimum or workable value or range by routine experimentation.

Furthermore, Iwano differs from the claimed invention in that Iwano does not disclose that the external modulation amplitude modulates the laser light. However, providing external modulation which amplitude modulates the laser light is well known. Takeyari et al is cited to show such well known concept. In col. 1, lines 42-59, Takeyari et al teach the use of amplitude modulator to modulated laser light. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to replace the external modulator of Iwano with that of amplitude modulator as taught by Takeyari et al. One of ordinary skill in the art would have been motivated to do such in order to provide simple and cost effective way of transmitting data.

Response to Arguments

3. Applicant's arguments with respect to claims 2, 7, 12 and 16 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Eskildsen et al (US Patent No. 5,477,368) is cited to show high

power lightwave transmitter using highly saturated amplifier for residual AM suppression.

Imai et al (US Patent No. 5,973,812) is cited to show optical transmitter and optical communication system.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalzid Singh whose telephone number is (571) 272-3029. The examiner can normally be reached on Mon-Fri 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272--3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DS
September 6, 2005

Dalzid Singh